HOSTED BY

ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IPEJ

Dual atrial rhythm on electrocardiogram

Shomu Bohora *

Department of Cardiology, U.N. Mehta I.C.R.C., Civil Hospital Campus, Asarwa, Ahmedabad, Gujarat 380016, India

ARTICLE INFO

Article history:
Available online 17 November 2015

Keywords:
Atrial tachycardia
Sinus entry block
Dual atrial rhythm

Case

A 65 year old lady, diagnosed to have atrial flutter and tachycardiomyopathy with left ventricular ejection fraction of 30%, on antiarrhythmic medications (amiodarone 200 mg twice daily and metoprolol 50 mg once a day) was referred for electrophysiology (EP) study and radiofrequency ablation (RFA). Electrocardiogram (ECG) showed a long RP tachycardia. Tachycardia was at nearly 156 beats per minute with a 1:1 atrio-ventricular conduction. Predominant P wave morphology during tachycardia suggested a low atrial origin of atrial tachycardia (P wave inverted in II, III, aVF). Every 3rd ventricular complex was earlier than expected and had a preceding different P wave, with morphology and axis similar looking to that of sinus origin, at a rate of 52 beats per minute, suggesting ventricular capture of sinus beats. This sinus impulse captured the ongoing atrial tachycardia as well and advanced the next atrial beat each time (Fig. 1).

In this patient, sinus nodal entry block with a critically timed sinus impulse, capturing the atrial tachycardia, and advancing it in a 1:3 fashion, is the likely cause of this uncommon ECG, demonstrating a dual atrial rhythm which is classically seen in transplanted hearts. Other instances of dual rhythm observed, not necessarily on ECG, but very occasionally during EP study are AV node reentry with an additional slow pathway behaving as a bystander, with or without capture beats or dual AV nodal physiology along with AV nodal echo beats during a stable orthodromic reciprocating tachycardia or atrial tachycardia.

During EP study, atrial tachycardia originating from the coronary sinus ostium was demonstrated with successful RFA performed. However dual atrial rhythm could not be demonstrated during EP study. Post ablation sinus node function assessment was abnormal and was attributed to the preceding incessant tachycardia and associated drug therapy. Sinus nodal entry block could not be demonstrated during pacing protocols post ablation. Sinus nodal entry block during atrial tachycardia could have been due to primary atrial disease or secondarily due to incessant atrial tachycardia and/or due to drugs. After one month of follow up, patient remained asymptomatic in sinus rhythm with normal left ventricular function.

* Tel.: +91 9727729045; fax: +91 7922682092.
E-mail address: shomubohora@yahoo.com.
Peer review under responsibility of Indian Heart Rhythm Society.
http://dx.doi.org/10.1016/j.ipej.2015.11.002

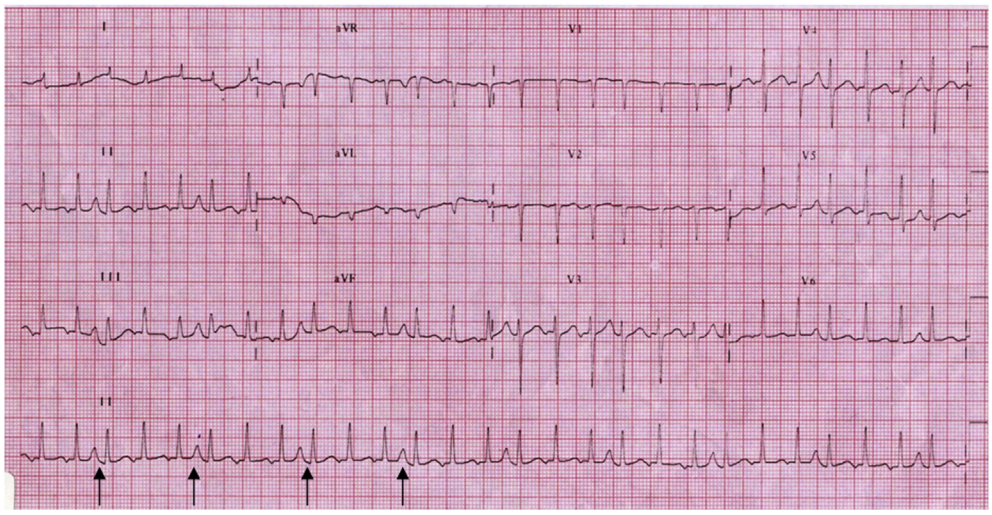

Fig. 1 – 12 lead electrocardiogram showing presence of dual atrial rhythm. Every 3rd ventricular complex is earlier than expected and had a preceding different P wave, with morphology and axis similar looking to that of sinus origin suggesting ventricular capture of sinus beat. This sinus impulse captured the ongoing atrial tachycardia as well and advanced the next atrial beat each time.